

An introduction to Iranian Collembola (Hexapoda): an update to the species list

Masoumeh Shayanmehr¹, Elliyyeh Yahyapour¹,
Morteza Kahrarian², Elham Yoosefi Lafooraki¹

¹ Department of Plant Protection, Faculty of Crop Sciences, Sari University of Agricultural Sciences and Natural Resources, Sari, Mazandaran, Iran, Po. Box. 578 ² Kermanshah Branch, Islamic Azad University, Kermanshah, Iran. Imam Khomeini Campus, Islamic Azad University, Farhikhtegan Bld., ShahidJafari St., Kermanshah, Iran

Corresponding author: *Masoumeh Shayanmehr* (shayanm30@yahoo.com)

Academic editor: *Louis Deharveng* | Received 8 May 2013 | Accepted 6 August 2013 | Published 25 September 2013

Citation: Shayanmehr M, Yahyapour E, Kahrarian M, Yoosefi Lafooraki E (2013) An introduction to Iranian Collembola (Hexapoda): an update to the species list. *ZooKeys* 335: 69–83. doi: 10.3897/zookeys.335.5491

Abstract

The Collembola fauna of Iran is little known and no comprehensive examination of this group of Hexapoda is available for this region. The only notable work on Collembola was carried out by Cox (1982). Recently, studies on the Collembola fauna have started in several regions. In this paper, publications by different researchers are documented and the species that have been found in different regions of Iran until January 2013 are listed. At present, 112 species, belonging to 18 families and 57 genera are known from Iran.

Keywords

Springtails, taxonomy, Iran, checklist

Introduction

Worldwide about 8,000 species of Collembola have been described (Bellinger et al. 1996–2012). Most Collembola species have been reported from Europe or North America but little literature or taxonomic keys are available from Asian countries especially from those of the Middle East.

Iran is a country in southwest Asia with an area of 1,648,195 km². It spans several different climatic zones and biomes, therefore the diversity of animals is high and this presumably also applies to those living in soil. According to biogeographic zonation, Iran has been considered part of the Palearctic region by most authors. However, some parts in the southern Iran, such as Khuzestan Plain and Persian Gulf coast, have been considered as Ethiopian (Cox 1982). The study of Collembola fauna of Iran is poor and most attention has been paid to crop pest species, which are few.

Farrahbakhsh (1961) was the first to provide information on Iranian Collembola. He reported *Sminthurus viridis* Linnaeus, 1758 from wheat and alfalfa fields in Khuzestan (Southern Iran). The most comprehensive study on Collembola was carried out by Cox (1982) who travelled to Northern, West and Central provinces in Iran and collected and identified 70 species of 30 genera and five families. The scientific names of some species recorded by Cox were changed later and their modern names are used in Appendix: *Cyphoderus ambigua* was changed to *Oncopodura ambigua* according to Christiansen (1957); the genus *Cryptopygus* Willem, 1902 was changed to *Hemisotoma* Börner, 1903 according to Rusek (2000). The species *Folsomia litsteri* Bagnall, 1939 was changed to *F. candida* (Willem, 1902); *F. multiseta* Stach, 1947 was changed to *F. penicula* Bagnall, 1939; *Neanura echinata* (Kos, 1940) was changed to *Thaumanura echinata* (Kos, 1940); the genus *Xenyllodes* Axelson, 1903 was changed to *Axenyllodes* Stach, 1949; *Xenyllodes lamellifera* was changed to *Superodontella lamellifera* (Axelson, 1903); *Onychiurus pseudogranulosus* Gisin, 1951 was changed to *Onychiuroides pseudogranulosus* (Gisin, 1951); *Onychiurus rectopapillatus* Stach, 1933 was changed to *Orthonychiurus rectopapillatus* (Stach, 1933). Also *Sminthurus marginatus* Schött, 1893 which is recorded by Kahrarian et al. (2012) was changed to *Caprinea marginata* (Schoett, 1893). Recently, some master and doctoral students started to work on the Collembola fauna of several regions of Iran and therefore the list of species certainly will increase.

Here we provide an update to the list of Iranian Collembola published from 1961 to 2013 mainly from the northern Iran. Obviously, the fauna of large parts of Iran is unknown and there is a need for additional research on the distribution of species but also on other aspects of these animals such as ecology, biology and their role in ecological processes in different ecosystems. It is the intention of the paper to encourage young entomologists to become aware of these gaps of knowledge and direct their interest towards Collembola fauna of this country.

Methods

The updated Iranian Collembola list was provided from two resources. First, it is based on bibliographic references and unpublished records from different regions (taxa not ascribed to species are not included in the total number of species). Second, results of sampling campaigns of Collembola by authors from different regions in Iran during 2009–2012 years are included. In the latter studies, soil and litter samples were collected from various habitats in Sari, Gorgan (Northern Iran) and Kermanshah



Figure 1. Extractor system for soil animals.

(Western Iran). The samples were placed in dark polythene bags. Collembola were extracted from soil and leaf litter by Berlese funnels (Figure 1). Animals were collected in water and separated under a dissecting microscope. The extracted specimens were preserved in 75% ethanol. Permanent microscopic slides were prepared using Hoyer medium; for immediate identification, a mixture of lactic acid and glycerin (5:1) was used. For observing detailed structures of specimens, a 100×oil immersion objective was used. The specimens were identified by taxonomic keys such as Gisin (1960), Fjellberg (1980, 1998, and 2007), Bretfeld (1999) and Potapov (2001). Identification of species was confirmed by Collembola experts such as Dr. Mikhail Potapov (Russia), Dr. Hans-Urgen Schulz (Germany), Dr. Ulrich Burkhardt (Germany) and Dr. Louis Deharveng (France).

Result and discussion

The number of Iranian Collembola species recorded until March 2012 is 112, belonging to 18 families and 57 genera. A systematic list of species according to the modern classification for the class Collembola (Deharveng, 2004) and details of species collection are shown in Appendix. The distribution of the species in the different provinces is shown in Figure 2. Most recorded species belong to Isotomidae (24%) and Entomobryidae (21%) (Figure 3). Collembola taxa for which species were not identified and which were reported as sp. was not included in this checklist. In addition to the genera shown in Appendix, some specimens from the genera, *Pachyotoma* (Bagnall, 1949), *Prodrepanura* (Stach, 1963), *Isotomodes* (Linnaniemi, 1907), *Gnathofolsomia* (Deharveng & Christian, 1984) *Protaphorura* (Absolon, 1901) (distributed in Kermanshah) by Kahrarian et al. (2012), *Orchesella* Templeton, 1835 (distributed in Kermanshah and Golestan) by Falahati et al. (2011), *Stenacidia* Reuter, 1881, (distributed in Gilan) by Daghighi (2012) were reported for Iran fauna but the species were not identified. Some species belonging to Symphyleona were recorded by Falahati et al. (2013b) with dubious identification, for example the photo illustrated the species *Sminthurinus reticulatus* seems to be belonging to Arrhopalitidae. The species listed in this paper include *Dicyrtomina ornata*, *Smin-*

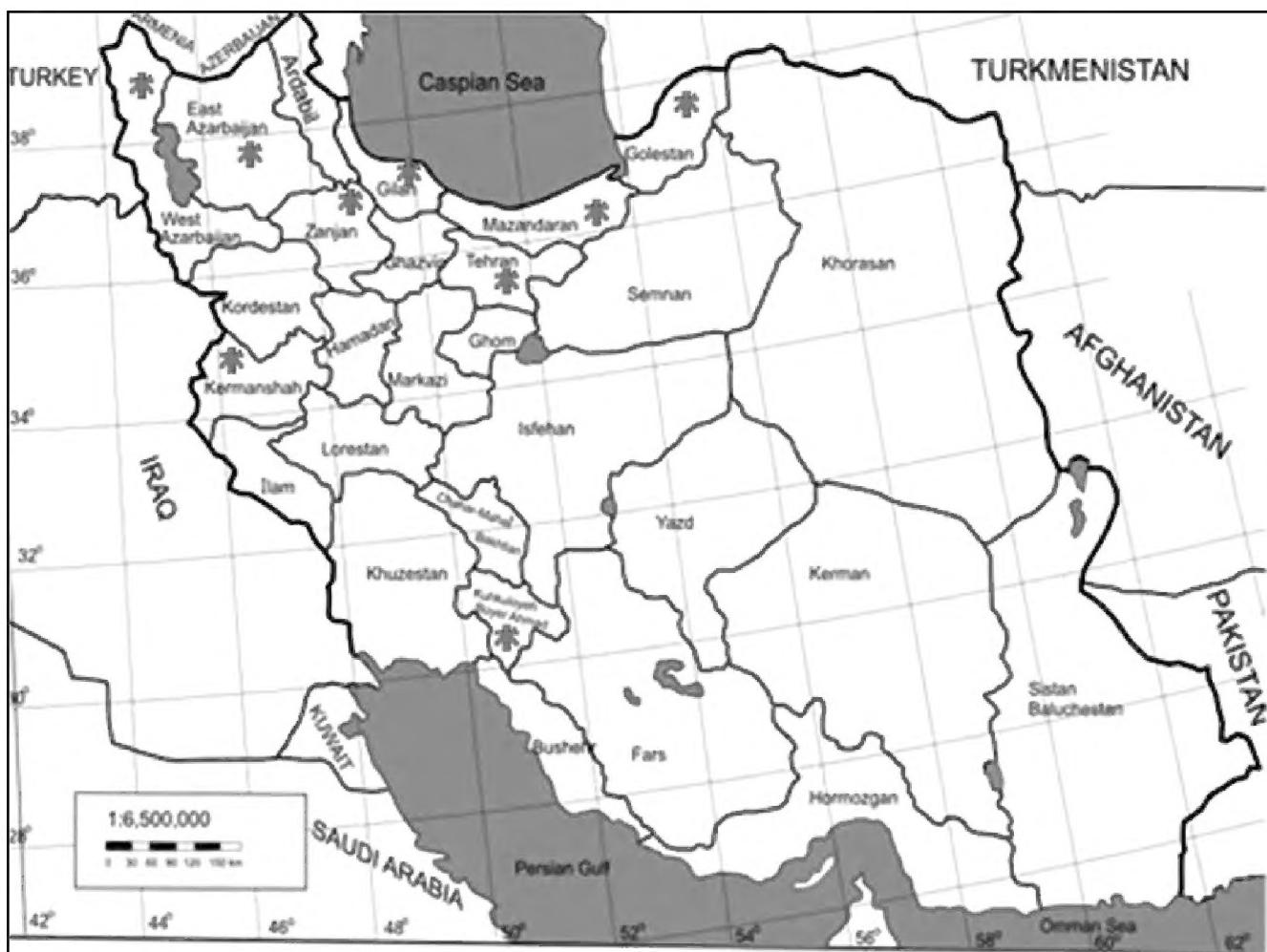


Figure 2. Map of Iran showing the provinces (*) from which Collembola have been collected.

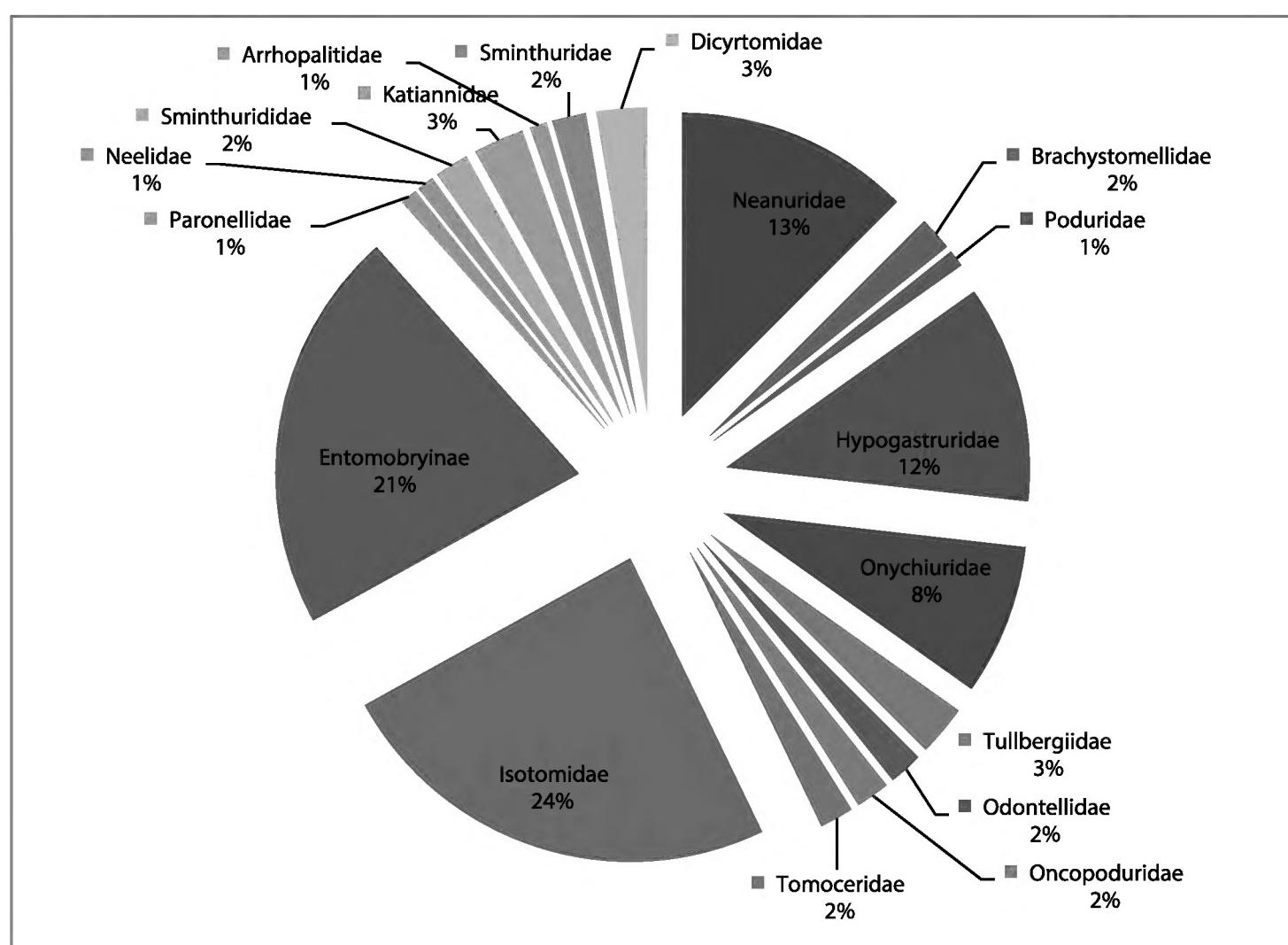


Figure 3. Percentage of Iranian Collembola species from different families.

thurides aquaticus, *Smynthurinus signatus*, *Smynthurinus transvernalis*, *Smynthurinus reticulatus* and *Smynthurinus elegans*. Additionally Dr. Bretfeld didn't confirm the identifications. For these reasons the species recorded in this paper are excluded from present checklist.

The results of this paper indicate that study of Collembola is at an early stage in Iran but recently interest in the group is increasing.

Acknowledgement

We thank Dr. Stefan Scheu for his comments and detailed revision of the manuscript. In addition, we are indebted to Dr. Mikhail Potapov (Russia), Dr. Hans Uergen Schulz (Germany), Dr. Ulrich Burkhart (Germany), and Dr. Louis Deharveng (France) for confirming the identification of species. Finally, we are grateful to Kenneth A. Christiansen (USA) for helpful comments for preserving and mounting Collembola.

References

- Bellinger PF, Christansen KA, Janssens F (1996–2012) Checklist of the Collembola of the World. <http://www.collembola.org> [accessed 20 March 2012]
- Bretfeld G (1999) Symphyleona. In: Dunger W (Ed) Synopses on Palaearctic Collembola, Vol. 2. Staatliches Museum für Naturkunde Görlitz, Germany, 318 pp.
- Christiansen K (1957) The Collembola of Lebanon and Western Syria, Part II. Families Cyphoderidae and Oncopoduridae, *Psyche*, 64(3): 77–89. doi: 10.1155/1957/32941
- Cox P (1982) The Collembola fauna of north and north western Iran. *Entomologist's Monthly Magazine* 118: 39–43.
- Daghighi E (2012) Fauna of Collembola (Insecta: Apterygota) from Rasht and its regions. MSc thesis, Guilan, Vol. 1. University of Guilan, Iran, 97pp. [in Persian with English abstract]
- Daghighi E, Hajizadeh J, Hosseini R, Moravvej A (2013a) A checklist of Iranian Collembola with six new records from family Isotomidae (Collembola: Isotomidae). *Entomofauna*, 11: 149–156.
- Daghighi E, Hajizadeh J, Hosseini R, Moravvej A (2013b) Introduction of eighteen species of springtails (Arthropoda: Collembola) from Guilan province with three new records for Iran. *Entomofauna* 13: 177–184.
- Deharveng L (2004) Recent advantages in Collembola systematics. *Pedobiologia* 48: 415–433. doi: 10.1016/j.pedobi.2004.08.001
- Falahati Hossein Abad A (2012) A Faunal Study on Springtails (Apterygota: Collembola) in Gorgan Regions. MSc thesis, Golestan, Vol. 1. Gorgan University of Agricultural Science and Natural Resources, Iran, 72 pp. [in Persian with English abstract]
- Falahati Hossein Abad A, Sarailoo MH, Shayan Mehr M, Yazdanian M (2011) New reports of three species of Springtails (Collembola) from Iran. Second Iranian pest management conference (Iran), September 2011. Bahonar University, Kerman, 1: 71–71.

- Falahati Hossein Abad A, Potapov M, Sarailoo MH, Shayan Mehr M (2013a) New records of Isotomidae (Collembola) from Golestan province (Iran). *Munis Entomology and Zoology* 8: 236–238.
- Falahati Hossein Abad A, Khyroodin A, Bretfeld J (2013b) New report of suborder Symphyleona species (Collembola) from Kohgiloyeh province (Iran). *Munis Entomology and Zoology* 8: 208–212.
- Falahati Hossein Abad A, Shayan Mehr M, Khyroodin A (2013c) A checklist of Iranian Collembola (Insecta: Apterygota). *Munis Entomology and Zoology* 8: 257–261.
- Falahati Hossein Abad A, Skarzynski D, Alizadeh S (2012) The report of six new species from Hypogastruridae (Apterygota: Collembola) for Iran fauna. Twentieth Iranian plant protection Congress (Iran), August 2012. Shiraz University, Fars, 1: 141–141.
- Farrahbakhsh GH (1961) A Checklist of Economically Important Insects and Other Enemies of Plant and Agricultural Products in Iran. Vol. 1. Department of Plant Protection, Ministry of Agriculture, Tehran, Iran, 153 pp. [in Persian]
- Fjellberg A (1980) Identification Keys to Norwegian Collembolan. Norsk Entomologisk Forening, Ås, 151 pp.
- Fjellberg A (1998) The Collembola of Fennoscandia and Denmark. Part I. Poduromorpha. Brill, Leiden, Boston, 183 pp.
- Fjellberg A (2007) The Collembola of Fennoscandia and Denmark. Part II. Entomobryamorpha and Symphyleona. Vol. 42. Brill, Leiden, Boston, 265 pp. doi: 10.1163/ej.9789004157705.i-265
- Ghahramaninezhad S, Shayanmehr M, Yoosefi E (2012) Report of new Collembola (Arthropoda: Hexapoda) species from Kermanshah. Twentieth Iranian plant protection Congress (Iran), August 2012. Shiraz University, Fars, 1: 213–213.
- Gisin H (1960) Collembolen fauna Europas. Museum d'Histoire Naturelle, Genève, Switzerland, 312 pp.
- Kahrarian M, Nikpy A, Mohammadi Noor L (2012) Preliminary checklist of the Collembolan fauna in Kermanshah, Sahneh and Harsin counties (Kermanshah: Iran) with two new records for Iranian fauna. *Pakistan Entomologist* 34(1): 27–30.
- Kahrarian M, Shaobo J, Nikpy A, Mohammadi Noor L, Yan Z, Yuping Z (2011) The first report of genus of Entomobryidae (Hexapoda: Collembola) from Iran. Global Conference on Entomology, March 2012, Chiang Mai, Thailand, 1: 267–267.
- Moravvej SA (2003) Biodiversity of Collembola of Tehran Region and Preliminary Observation on Several Species. MSthesis, Tehran, Vol. 1. Tarbiat Modares University, Iran, 135 pp. [in Persian with English abstract]
- Moravvej SA, Potapov M, Kamali K, Hodjat SH (2007) Isotomidae (Collembola of the Tehran region, Iran). *Zoology in the Middle East* 41: 117–118. doi: 10.1080/09397-140.2007.10638238
- Mossadegh MS (1995) Insect in beavers of Apismellifera L. in Iran. *Journal of Agriculture Sciences of Islamic Azad University* 1: 21–27. [in Persian]
- Nematollahi M, Bagheri M, Radwanski J (2009) New reports of Collembola for Iran with surveying of the importance in the greenhouses of Isfahan province, Iran. *Plant Protection Journal, Islamic Azad University, Shiraz branch* 3: 327–335. [in Persian with English abstract]

- Potapov M (2001) Isotomidae. In: Dunger W (Ed) Synopses on Palaearctic Collembola, Vol. 3. Staatliches Museum für Naturkunde Görlitz, Germany, 603 pp.
- Rusek J (2000) Do we have *Cryptopygus* — representatives (Collembola: Isotomidae) in Europe? Proceedings of the Xth international Colloquium on Apterygota, České Budějovice *Pedobiologia*, 46(3–4): 302–310.
- Smolis A, Falahati A, Skarżyński D (2012) The genus *Cryptonura* Cassagnau, 1979 (Collembola: Neanuridae: Neanurinae) in Iran. Zootaxa 3530: 51–58.
- Yahyapour E (2012) Faunistic Study on Collembola (Insecta: Apterygota) in Sari Regions. MSc thesis, Sari, Vol. 1. Sari Agricultural Science and Natural Resources University, Iran, 96 pp. [in Persian with English abstract]
- Yahyapour E, Shayan Mehr M, Damavandian MR (2011) New reports of six species Entomobryidae (Apterygota: Collembola) for Iran. Second Iranian pest management conference, September 2011, Iran. Bahonar university, Kerman, 1: 74–74.

Appendix

Checklist of Iranian Collembola species. Species marked by * were recorded for the first time from Iran.

Taxonomy Class/Order/Family/Subfamily/ Species	Reference	Distribution in Iran Province/Location	Habitat
Class Collembola			
Order Poduromorpha			
Family Neanuridae			
Subfamily Pseudachorutinae			
Genus Anurida Laboulbne, 1865			
<i>Anurida ellipsoidea</i> Stach, 1949	Cox (1982)	E. Azarbaijan, W. Azarbaijan	Soil, Leaf litter
<i>Anurida sensillata</i> Gisin, 1953	Cox (1982)	Gilan	Soil, Leaf litter
<i>Anurida thalassophila</i> (Bagnall, 1939)	Cox (1982)	Gilan, E. Azarbaijan	Soil, Leaf litter
Genus Pseudachorutes Tullberg, 1871			
<i>Pseudachorutes dubius</i> Krausbauer, 1898	Cox (1982)	Central, Gilan	Soil, Leaf litter
<i>Pseudachorutes parvulus</i> Börner, 1901	Cox (1982)	Central, Gilan	Soil, Leaf litter
<i>Pseudachorutes subcrassus</i> Tullberg, 1871	Cox (1982)	Central, Gilan	Soil, Leaf litter
Subfamily Frieseinae			
Genus Friesea Dalla Torre, 1895			
<i>Friesea mirabilis</i> (Tullberg, 1871)	Cox (1982)	Central, Gilan, E. Azarbaijan	Soil, Leaf litter
Subfamily Morulininae			
Genus Morulina Börner, 1906			
<i>Morulina verrucosa</i> Börner, 1903*	Daghichi (2012)	Gilan/Rasht	Soil (<i>Ulmus</i> sp.)
Subfamily Neanurinae			
Genus Bilobella Caroli, 1912			
<i>Bilobella aurantiaca</i> (Caroli, 1912)	Cox (1982)	Central, Mazandaran, Gilan, E. Azarbaijan	Soil, Leaf litter
Genus Cryptonura Cassagnau, 1979			
<i>Cryptonura persica</i> sp. n.*	Smolis et al. (2012)		
<i>Cryptonura maxima</i> sp. n.*	Smolis et al. (2012)		
Genus Deutonura Cassagnau, 1979			
<i>Deutonura decolorata</i> (Gama & Gisin, 1964)	Cox (1982)	Mazandaran	Soil, Leaf litter
Genus Neanura MacGillivray, 1893			
<i>Thaumanura echinata</i> (Kos, 1940)	Cox (1982)	unknown	Soil, Leaf litter
<i>Neanura muscorum</i> (Templeton, 1835)	Cox (1982) Yahyapour (2012)	Mazandaran, Gilan, Zanjan Mazandaran/ Sari	Leaf litter
Family Brachystomellidae			
Genus Brachystomella Agren, 1903			
<i>Brachystomella parvula</i> (Schäffer, 1896)	Cox (1982)	Gilan, E. Azarbaijan, Zanjan	Soil, Leaf litter
<i>Brachystomella nubila</i> Gisin, 1957	Cox (1982)	Gilan, E. Azarbaijan, Zanjan	Soil, Leaf litter
Family Poduridae			
Genus Podura Linnaeus, 1758			
<i>Podura aquatica</i> Linnaeus, 1758	Cox (1982)	Central	Soil, Leaf litter near water
Family Hypogastruridae			
Genus Ceratophysella Börner, 1932			
<i>Ceratophysella armata</i> (Nicolet, 1841)*	Falahati et al. (2012)	Kohgiluyeh and Boyer-Ahmad, Charam	Soil

Taxonomy Class/Order/Family/Subfamily/ Species	Reference	Distribution in Iran Province/Location	Habitat
<i>Ceratophysella denticulata</i> (Bagnall, 1941)	Cox (1982) Yahyapour (2012) Ghahramaninezhadand et al. (2012)	Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan, Zanjan Mazandaran/ Sari Kermanshah	Leaf litter Soil
<i>Ceratophysella stercoraria</i> Stach, 1963*	Kahrarian et al. (2012) Falahati et al. (2012)	Kermanshah, Sahneh Kohgiluyeh and Boyer-Ahmad, Charam	Soil
Genus <i>Choreutinula</i> Paclt, 1944			
<i>Choreutinula inermis</i> Tullberg, 1871*	Daghichi (2012)	Gilan/Rasht	Soil (<i>Prunus</i> sp., <i>Ficus</i> sp., <i>Platanus</i> sp., <i>Ulmus</i> sp., <i>Alnus</i> sp.)
Genus <i>Hypogastrura</i> Bourlet, 1839			
<i>Hypogastrura assimilis</i> (Krausbauer, 1898)*	Falahati et al. (2012)	Kohgiluyeh and Boyer-Ahmad, Charam	Soil
<i>Hypogastrura manubrialis</i> (Tullberg, 1869)	Cox (1982) Falahati et al. (2012)	Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan, Zanjan Kohgiluyeh and Boyer-Ahmad, Charam	Soil, Leaf litter
<i>Hypogastrura tullbergi</i> (Schäffer, 1900)	Cox (1982)	Mazandaran, Gilan	Soil, Leaf litter
<i>Hypogastrura vernalis</i> (Carl, 1901)*	Falahati et al. (2012)	Kohgiluyeh and Boyer-Ahmad, Charam	Soil
Genus <i>Xenylla</i> Tullberg, 1869			
<i>Xenylla humicola</i> (Fabricius, 1780)	Cox (1982)	Gilan, E. Azarbaijan, W. Azarbaijan	Soil, Leaf litter
<i>Xenylla maritima</i> Tullberg, 1869	Cox (1982)	Gilan, E. Azarbaijan, W. Azarbaijan	Soil, Leaf litter
<i>Xenylla welchi</i> Folsom, 1916*	Yahyapour (2012) Falahati et al. (2012)	Mazandaran/ Sari Kohgiluyeh and Boyer-Ahmad, Charam	Leaf litter Soil
Genus <i>Willemia</i> Börner, 1901			
<i>Willemia anophthalma</i> Börner, 1901	Cox (1982)	Central, E. Azarbaijan	Soil, Leaf litter
<i>Willemia aspinata</i> Stach, 1949*	Daghichi (2012)	Gilan/Rasht	Soil (<i>Pinus</i> sp.)
Family Onychiuridae			
Subfamily Onychiurinae			
Genus <i>Protaphorura</i> Absolon, 1901			
<i>Protaphorura fimata</i> (Gisin, 1952)	Cox (1982)	Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan, Zanjan	Soil, Leaf litter
<i>Protaphorura bicampata</i> (Gisin, 1956)	Cox (1982)	Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan, Zanjan	Soil, Leaf litter
<i>Protaphorura quadriocellata</i> (Gisin, 1947)	Cox (1982)	Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan, Zanjan	Soil, Leaf litter
Genus <i>Onychiuroides</i> Bagnall, 1948			
<i>Onychiuroides granulosus</i> (Stach, 1930)	Cox (1982)	Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan, Zanjan	Soil, Leaf litter
<i>Onychiuroides pseudogranulosus</i> (Gisin, 1951)	Cox (1982)	Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan, Zanjan	Soil, Leaf litter

Taxonomy Class/Order/Family/Subfamily/ Species	Reference	Distribution in Iran Province/Location	Habitat
Genus <i>Hymenaphorura</i> Gervais, 1841			
<i>Hymenaphorura sibirica</i> (Tullberg, 1876)	Cox (1982)	Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan, Zanjan	Soil, Leaf litter
Genus <i>Orthonychiurus</i> Stach, 1954			
<i>Orthonychiurus folsomi</i> (Schäffer, 1900)*	Yahyapour (2012)	Mazandaran/ Sari	Leaf litter
<i>Orthonychiurus rectopapillatus</i> (Stach, 1933)	Cox (1982)	Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan, Zanjan	Soil, Leaf litter
Subfamily Tetrodontophorinae			
Genus <i>Tetrodontophora</i> Reuter, 1882			
<i>Tetrodontophora bielanensis</i> (Waga, 1842)*	Daghichi (2012)	Gilan/Rasht	Soil (<i>Ulmus</i> sp., <i>Prunus</i> sp., <i>Alnus</i> sp., <i>Parrotia</i> <i>persica</i> , <i>Acer</i> sp., <i>Salix alba</i> , <i>Punica</i> sp., <i>Robinia</i> sp., <i>Eriobotrya</i> sp., <i>Populus</i> sp.)
Family Tullbergiidae			
Genus <i>Mesaphorura</i> Börner, 1901			
<i>Mesaphorura krausbaueri</i> (Börner, 1901)	Cox (1982)	Central, Mazandaran, Gilan, E. Azarbaijan, Zanjan	Soil, Leaf litter
Genus <i>Metaphorura</i> Stach, 1954			
<i>Metaphorura affinis</i> Börner, 1902	Cox (1982) Daghichi (2012) Ghahramaninezhad et al.(2012)	Central, Gilan, E. Azarbaijan Gilan/Rasht Kermanshah	Soil (<i>Quercus</i> sp., <i>Platanus</i> sp., <i>Alnus</i> sp., <i>Punica</i> sp., <i>Ulmus</i> sp., <i>Pinus</i> sp., <i>Cupressus</i> sp., <i>Robinia</i> sp., <i>Eriobotrya</i> sp., <i>Zelkova</i> sp.) litter
Genus <i>Paratullbergia</i> Womersley, 1930			
<i>Paratullbergia callipygos</i> (Börner, 1902)	Cox (1982)	Central, Zanjan	Soil, Leaf litter
Family Odontellidae			
Genus <i>Axenyllodes</i> Stach, 1949			
<i>Axenyllodes bayeri</i> Kseneman, 1935	Cox (1982)	Gilan, E. Azarbaijan	Soil, Leaf litter
Genus <i>Superodontella</i> Stach, 1949			
<i>Superodontella lamellifera</i> (Axelson, 1903)	Cox (1982)	E. Azarbaijan	Soil, Leaf litter
Order Entomobryomorpha			
Family Oncopoduridae			
Genus <i>Oncopodura</i> Carl & Lebedinsky, 1905			
<i>Oncopodura ambigua</i> Christiansen, 1957	Cox (1982)	Mazandaran, Gilan	Soil, leaf litter
<i>Oncopodura hamata</i> Carl & Lebedinsky, 1905*	Daghichi (2012)	Gilan/Rasht	Soil (<i>Ulmus</i> sp., <i>Prunus</i> sp.)

Taxonomy Class/Order/Family/Subfamily/ Species	Reference	Distribution in Iran Province/Location	Habitat
Family Tomoceridae			
Genus <i>Tomocerus</i> Nicolet, 1842			
<i>Tomocerus minor</i> (Lubbock, 1862)	Cox (1982)	Central, Mazandaran, Gilan, E. Azarbaijan, Zanjan	Soil, Leaf litter
<i>Tomocerus vulgaris</i> (Tullberg, 1871)	Cox (1982)	Central, Mazandaran, Gilan, E. Azarbaijan, Zanjan	Soil, Leaf litter
Family Isotomidae			
Genus <i>Anurophorus</i> Nicolet, 1842			
<i>Anurophorus coiffaiti</i> Cassagnau & Delamare, 1955*	Falahati (2012) Falahati et al. (2013a) Daghichi (2012) Daghichi et al.(2013a) Daghichi et al.(2013b)	Golestan/Gorgan Gilan/Rasht	Soil (<i>Ulmus</i> sp., <i>Punica</i> sp.)
Genus <i>Ballistura</i> Börner, 1906			
<i>Ballistura schoetti</i> (Dalla Torre, 1895)	Cox (1982)	Gilan	Soil, Leaf litter
Genus <i>Hemisotoma</i> Bagnall, 1949			
<i>Hemisotoma thermophila</i> (Axelson, 1900)	Cox (1982) Daghichi (2012) Daghichi et al.(2013a) Daghichi et al.(2013b)	Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan Gilan/Rasht	Soil (<i>Ulmus</i> sp., <i>Ficus</i> sp., <i>Ziziphus</i> sp., <i>Populus</i> sp.) Leaf litter
Genus <i>Desoria</i> Nicolet, 1841			
<i>Desoria tigrina</i> Nicolet, 1842*	Kahrarian et al. (2012)	Kermanshah	Soil
<i>Desoria olivacea</i> (Tullberg, 1871)	Cox (1982)	E. Azarbaijan	Soil, litter
Genus <i>Folsomia</i> Willem, 1902			
<i>Folsomia binoculata</i> (Wahlgren 1899)*	Ghahramaninezhad et al. (2012)	Kermanshah	Soil
<i>Folsomia brevifurca</i> (Bagnall, 1949)	Cox (1982)	Mazandaran	Soil, Leaf litter
<i>Folsomia candida</i> (Willem, 1902)	Cox (1982) Yahyapour (2012)	Central, Mazandaran, Gilan, E. Azarbaijan Mazandaran/Sari	Soil, Leaf litter
<i>Folsomia fimetaria</i> (Linnaeus, 1758)	Cox (1982)	Central, Mazandaran, Gilan	Soil, Leaf litter
<i>Folsomia penicula</i> Bagnall, 1939*	Cox (1982) Falahati (2012) Falahati et al. (2013a) Daghichi (2012) Daghichi et al.(2013a) Daghichi et al.(2013b) Falahati et al. (2011)	Central, Mazandaran, E. Azarbaijan Golestan/Gorgan Gilan/Rasht	Soil (<i>Quercus</i> sp.)
<i>Folsomia quadrioculata</i> (Tullberg, 1871)	Cox (1982)	Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan	Soil, Leaf litter
<i>Folsomia similis</i> Bagnall, 1939*	Moravvej et al. (2007) Daghichi (2012) Daghichi et al.(2013a) Daghichi et al.(2013b)	Tehran Gilan/Rasht	Soil (<i>Ficus</i> sp., <i>Pinus</i> sp.)
Genus <i>Folsomides</i> Stach, 1922			
<i>Folsomides angularis</i> Axelson, 1905*	Daghichi (2012) Daghichi et al.(2013a) Daghichi et al.(2013b)	Gilan/Rasht	Soil (<i>Prunus</i> sp.)
<i>Folsomides marchicus</i> (Frenzel, 1941)*	Kahrarian et al. (2012)	Kermanshah/Sahneh/Harsin	Soil

Taxonomy Class/Order/Family/Subfamily/ Species	Reference	Distribution in Iran Province/Location	Habitat
<i>Folsomides parvulus</i> Stach, 1922	Cox (1982) Yahyapour (2012) Kahrarian et al. (2012) Daghichi (2012) Daghichi et al.(2013a) Daghichi et al.(2013b)	Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan Mazandaran/ Sari Kermanshah/Sahneh/Harsin Gilan/Rasht	Soil (<i>Morus</i> sp.), Leaf litter
Genus <i>Isotoma</i> Bourlet, 1839			
<i>Isotoma viridis</i> Bourlet, 1839	Cox (1982) Yahyapour (2012)	Central, Mazandaran, E. Azarbaijan, W. Azarbaijan Mazandaran/ Sari	Soil, Leaf litter
Genus <i>Isotomiella</i> Bagnall, 1939			
<i>Isotomiella minor</i> (Schäffer, 1896)	Cox (1982) Moravvej et al. (2007) Yahyapour (2012) Daghichi (2012) Daghichi et al.(2013a) Daghichi et al.(2013b) Ghahramaninezhad et al. (2012)	Mazandaran, Gilan, E. Azarbaijan Tehran Mazandaran/ Sari Gilan/Rasht Kermanshah	Soil (<i>Quercus</i> sp., <i>Prunus</i> sp., <i>Pinus</i> sp.) Leaf litter
Genus <i>Isotomina</i> Börner, 1903			
<i>Hemisotoma pontica</i> Stach, 1947	Cox (1982) Moravvej et al. (2007) Kahrarian et al. (2012) Yahyapour (2012)	Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan Tehran Kermanshah Mazandaran/ Sari	Soil, Leaf litter
<i>Hemisotoma orientalis</i> Stach, 1947	Cox (1982)	Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan	Soil, Leaf litter
Genus <i>Isotomurus</i> Börner, 1903			
<i>Isotomurus maculatus</i> (Schäffer, 1869)*	Falahati (2012) Falahati et al. (2013a) Falahati et al. (2011)	Golestan/ Gorgan	Soil
<i>Isotomurus palustris</i> (Muller, 1776)	Cox (1982)	Central, Mazandaran, Gilan	Soil, Leaf litter
<i>Isotomurus punctiferus</i> Yosii, 1963*	Falahati (2012) Falahati et al. (2013a) Daghichi (2012) Daghichi et al.(2013a) Daghichi et al.(2013b)	Golestan/Gorgan Gilan/Rasht	Soil
Genus <i>Parisotoma</i> Bagnall, 1940			
<i>Parisotoma notabilis</i> (Schäffer, 1896)	Cox (1982) Moravvej et al. (2007) Kahrarian et al. (2012) Daghichi (2012) Daghichi et al.(2013a) Daghichi et al.(2013b)	Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan, Zanjan Tehran Kermanshah Gilan/Rasht	Soil (<i>Platanus</i> sp., <i>Ulmus</i> sp., <i>Cupressus</i> sp.) Leaf litter
Genus <i>Proisotoma</i> Börner, 1901			
<i>Proisotoma minima</i> Absolon, 1901*	Yahyapour (2012)	Mazandaran/ Sari	Leaf litter
<i>Proisotoma minuta</i> (Tullberg, 1871)	Cox (1982) Nematollahi et al. (2009)	Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan	Soil, Leaf litter, African violet
<i>Proisotoma subminuta</i> Denis, 1931*	Moravvej et al. (2007) Daghichi (2012) Daghichi et al.(2013a) Daghichi et al.(2013b)	Tehran Gilan/Rasht	Soil (<i>Ulmus</i> sp.)

Taxonomy Class/Order/Family/Subfamily/ Species	Reference	Distribution in Iran Province/Location	Habitat
<i>Proisotoma tenella</i> Reuter, 1895*	Daghichi (2012) Daghichi et al.(2013a) Daghichi et al.(2013b)	Gilan/Rasht	Soil (<i>Melia</i> sp.)
Family Entomobryidae			
Subfamily Entomobryinae			
Genus <i>Entomobrya</i> Rondani, 1861			
<i>Entomobrya atrocincta</i> Schött, 1986*	Yahyapour (2012) Yahyapour et al. (2011) Kahrarian et al. (2012)	Mazandaran/Sari Kermanshah/ Harsin	Leaf litter
<i>Entomobrya corticalis</i> (Nicolet, 1841)	Cox (1982)	Gilan	Soil, Leaf litter
<i>Entomobrya dollfusi</i> Denis, 1924*	Yahyapour (2012)	Mazandaran/ Sari	Leaf litter
<i>Entomobrya lindbergi</i> Stach, 1960*	Daghichi (2012) Daghichi et al.(2013b) Moravvej (2003)	Gilan/Rasht Tehran	Soil (<i>Alnus</i> sp. and <i>Ulmus</i> sp.)
<i>Entomobrya lanuginosa</i> (Nicolet, 1841)	Cox (1982)	Central, Mazandaran, Gilan, E. Azarbaijan	Soil, Leaf litter
<i>Entomobrya handschini</i> Stach, 1922*	Moravvej (2003)	Tehran	Soil
<i>Entomobrya multifasciata</i> Tullberg, 1871*	Yahyapour (2012) Yahyapour et al. (2011)	Mazandaran/ Sari	Leaf litter
<i>Entomobrya unostrigata</i> Stach, 1930*	Moravvej (2003)	Tehran	Soil
Genus <i>Mesentotoma</i> Salmon, 1942			
<i>Mesentotoma subdollfusi</i> Jacquemart, 1974*	Daghichi (2012) Daghichi et al.(2013b)	Gilan/Rasht	Soil(<i>Alnus</i> sp., <i>Ulmus</i> sp., <i>Parrotia</i> <i>persica</i> , <i>Acer</i> sp. and <i>Salix alba</i>)
Genus <i>Sinella</i> Brook, 1882			
<i>Sinella curviseta</i> Brook, 1882*	Moravvej (2003)	Tehran	Soil
<i>Sinella tenebricosa</i> Folsom, 1902*	Nematollahi et al. (2009)	Isfahan/ Isfahan	vegetables and cucumber greenhouses
Subfamily Lepidocyrtinae			
Genus <i>Lepidocyrtus</i> Bourlet, 1839			
<i>Lepidocyrtus cyaneus</i> Tullberg, 1871	Cox (1982)	Central, Mazandaran, Gilan, E. Azarbaijan, Zanjan	Soil, Leaf litter
<i>Lepidocyrtus lanuginosus</i> (Gmelin, 1788)	Cox (1982)	Central, Mazandaran, Gilan, E. Azarbaijan	Soil, Leaf litter
<i>Lepidocyrtus ruber</i> Schött, 1902	Cox (1982)	Central, Mazandaran, Gilan, E. Azarbaijan	Soil, Leaf litter
Genus <i>Pseudosinella</i> Schaefer, 1897			
<i>Pseudosinella alba</i> (Packard, 1873)*	Daghichi (2012) Daghichi et al.(2013b)	Gilan/Rasht	Soil (<i>Quercus</i> sp., <i>Ulmus</i> sp., <i>Platanus</i> sp., <i>Alnus</i> sp., <i>Parrotia persica</i> , <i>Acer</i> sp. <i>Salix</i> <i>alba</i> , <i>Punica</i> sp.)
<i>Pseudosinella duodecimpunctata</i> Denis, 1931	Cox (1982)	E. Azarbaijan	Soil, Leaf litter
<i>Pseudosinella imparipunctata</i> Gisin, 1953	Cox (1982)	Mazandaran, Gilan, Zanjan	Soil, Leaf litter

Taxonomy Class/Order/Family/Subfamily/ Species	Reference	Distribution in Iran Province/Location	Habitat
<i>Pseudosinella octopunctata</i> Böner, 1901	Cox (1982) Yahyapour et al. (2011) Yahyapour (2012)	Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan, Zanjan Mazandaran/Sari	Soil, Leaf litter
<i>Pseudosinella sexoculata</i> (Schött, 1902)*	Ghahramaninezhad et al.(2012)	Kermanshah	Soil
Subfamily Seirinae			
Genus <i>Seira</i> Lubbock, 1870			
<i>Seira domestica</i> Nicolet, 1842*	Yahyapour (2012) Yahyapour et al. (2011) Kahrarian et al. (2011) Daghghi (2012) Daghghi et al.(2013b)	Mazandaran/Sari Kermanshah/ Harsin Gilan/ Rasht	Leaf litter, Soil (<i>Magnolia</i> sp., <i>Ficus</i> sp., <i>Ulmus</i> sp., <i>Prunus</i> sp.)
Subfamily Willowsiinae			
Genus <i>Willowsia</i> Shoebottom, 1917			
<i>Willowsia nigromaculata</i> Lubbock, 1873*	Daghghi (2012) Daghghi et al.(2013b)	Gilan/Rasht	Soil (<i>Platanus</i> sp., <i>Prunus</i> sp., <i>Ulmus</i> sp., <i>Ficus</i> sp., <i>Alnus</i> sp., <i>Quercus</i> sp.)
Subfamily Orchesellinae			
Genus <i>Heteromurus</i> Wankel, 1860			
<i>Heteromurus major</i> (Moniez, 1889)	Cox (1982) Yahyapour (2012) Yahyapour et al. (2011) Daghghi (2012) Daghghi et al.(2013b)	Central, Mazandaran, Gilan, E. Azarbaijan Mazandaran/Sari Gilan/ Rasht	Soil, Leaf litter
<i>Heteromurus nitidus</i> (Templeton, 1835)	Cox (1982)	Mazandaran, Gilan	Soil, Leaf litter
<i>Heteromurus sexoculatus</i> Brown, 1926	Cox (1982)	Mazandaran	Soil, Leaf litter
Family Paronellidae			
Genus <i>Cyphoderus</i> Nicolet, 182			
<i>Cyphoderus albinus</i> Nicolet, 1842*	Daghghi (2012)	Gilan/Rasht	Soil (<i>Platanus</i> sp.)
Order Neelipleona			
Family Neelidae			
Genus <i>Neelus</i> Folsom, 1896			
<i>Neelus murinus</i> Folsom, 1896	Cox (1982)	Central, Mazandaran, E. Azarbaijan	Soil, Leaf litter
Order Symphypleona			
Family Sminthurididae			
Genus <i>Sphaeridia</i> Linnaniemi, 1912			
<i>Sphaeridia pumilis</i> (Krausbauer, 1898)	Cox (1982) Kahrarian et al. (2012)	Central, Gilan Kermanshah/ Sahneh/Harsin	Soil, Leaf litter
Genus <i>Sminthurides</i> Börner, 1900			
<i>Sminthurides malmgreni</i> (Tullberg, 1876)	Cox (1982)	Central, Gilan, E. Azarbaijan	Soil, Leaf litter

Taxonomy Class/Order/Family/Subfamily/ Species	Reference	Distribution in Iran Province/Location	Habitat
Family Katiannidae			
Genus <i>Sminthurinus</i> Börner, 1901			
<i>Sminthurinus aureus</i> Lubbock, 1862*	Yahyapour (2012) Daghghi (2012) Daghghi et al.(2013b)	Mazandaran/ Sari Gilan/Rasht	Leaf litter Soil (<i>Ulmus</i> sp., <i>Prunus</i> sp., <i>Acer</i> sp., <i>Cupressus</i> sp., <i>Robinia</i> sp., <i>Populus</i> sp.)
<i>Sminthurinus bimaculatus</i> (Axelson, 1902)	Cox (1982)	Gilan	Soil, Leaf litter
<i>Sminthurinus elegans</i> Fitch, 1863	Cox (1982) Yahyapour(2012) Falahati (2012) Ghahramaninezhad et al.(2012)	unknown Mazandaran/ Sari Golestan/ Gorgan Kermanshah	Soil Leaf litter Leaf litter Leaf litter
Family Arrhopalitidae			
Genus <i>Arrhopalites</i> Börner, 1906			
<i>Arrhopalites caecus</i> (Tullberg, 1871)	Cox (1982) Ghahramaninezhad et al.(2012)	Gilan, E. Azarbaijan Kermanshah	Soil, Leaf litter
Family Sminthuridae			
Genus <i>Sminthurus</i> Latreille, 1804			
<i>Sminthurus viridis</i> Linnaeus, 1758*	Farrahbakhsh (1961)	Khuzestan	wheat and alfalfa fields
Genus <i>Caprainea</i> Dallai 1970			
<i>Caprainea marginata</i> (Schott, 1893)*	Kahrarian et al. (2012)	Kermanshah/Sahneh/Harsin	Soil
Family Dicyrtomidae			
Genus <i>Dicyrtomina</i> Börner, 1903			
<i>Dicyrtomina ornata</i> Nicolet, 1842*	Yahyapour (2012)	Mazandaran/ Sari	Leaf litter
Genus <i>Dicyrtoma</i> Bourlet, 1841			
<i>Dicyrtoma minuta</i> (Fabricius, 1783)	Cox (1982)	Mazandaran, Gilan	Soil, Leaf litter
<i>Dicyrtoma fusca</i> Lubbock, 1873*	Yahyapour (2012)	Mazandaran/ Sari	Leaf litter

